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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,675	01/21/2004	Jesse Raymond Black	TH2435 (US)	3152

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EXAMINER

GALE, KELLETTE

ART UNIT PAPER NUMBER

1621

DATE MAILED: 07/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/761,675	BLACK, JESSE RAYMOND	
	<b>Examiner</b>	<b>Art Unit</b>	
	Kellette Gale	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 24 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-140 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17, 18, 59-64 and 89-140 is/are allowed.
- 6) ☒ Claim(s) 1-16, 19-51, 53, 54, 57, 58 and 65-82 is/are rejected.
- 7) ☒ Claim(s) 52, 55-56, and 83-88 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/24/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

Claims 1-16, 19-51, 53, 54, 57, 58, and 65-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zakoshansky in view of Pompetzki et al (JP 2001-097901).

Applicant claims a process for the decomposition of CHP wherein the first cleavage is carried out at a temperature range of 45-70°C in the presence of an acidic catalyst and 95% or more of the s-butylbenzene hydroperoxide and/or CHP are cleaved into a mixture of phenol and acetone. Conversions of dimethylbenzyl alcohol and ethyl methyl benzyl carbinol are said to be present in the reaction and acetone and water are said to be a part of the cleavage reaction feed. The claims also recite a pressure of about 0.5 atmospheres or more.

### **Determination of the scope and content of the prior art**

#### **(MPEP §2141.01)**

Zakoshansky discloses a method for enhanced decomposition of cumene hydroperoxide (CHP) by acidic catalyst to phenol and acetone that comprises decomposing CHP in the presence of acetone (please see abstract of the disclosure and col. 4, lines 38-41). This decomposition reaction involves a feed stream of cumene being oxidized to CHP that is then passed into a cleavage unit comprising three reactors wherein an acid catalyst is added and the CHP is then decomposed to phenol, acetone, and other by-products. The CHP decomposition and process is conducted in 1 to 2 minutes (column7, lines 9-11). The CHP cleavage products are recirculated to

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the CHP feedstream through reaction circulation loop 4 at a circulation ratio of 20:1 (see drawing fig. 1 and column 7, lines 22-25).

Sulfuric acid is said to be the preferred catalyst in this process (column 4, lines 12-24). The cleavage is run in a multiplicity of reactors in sequence and the temperature can vary from 45-74°C (column 4, lines 54-57). Water is added to the reaction in a preferred amount of 0.8-1.2 wt. % (column 5, lines 53-57). The process also involves conversion of by-products, namely, DMBA is reacted to form alpha-methylstyrene (column 1, lines 24-28). Zakoshansky also teaches that it is normal in the art to use a commercial scale continuous stirred reactor for CHP decomposition (column 1, lines 12-14). The pressure used is said to be from about 0.3 to 5 atmospheres (column 6, line 38).

Pompetzki et al teach the combined decomposition of s-butylbenzene hydroperoxide and CHP in the production of phenol and acetone reciting the advantage of a speedy oxidation and a decreased formation of by-products (please see ¶ 0018, page 4). Also, conversion is said to exceed 95% (please see ¶ 0034).

#### **Ascertainment of the difference between the prior art and the claims**

##### **(MPEP §2141.02)**

Zakoshansky fails to teach the combined decomposition of s-butylbenzene hydroperoxide and CHP in the production of phenol and acetone, whereas Pompetzki et al fail to teach the process of decomposing CHP wherein a temperature range of about 50-62°C is utilized with a pressure of about 0.3 to 5 atmospheres.

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The temperature and pressure ranges taught by Zakoshansky although are not specifically that which is claimed by applicant, does fall within the claimed ranges. Also, Zakoshansky teaches the first step of cleaving CHP using three reactors, whereas, applicant claims that step to use only one reactor.

### **Finding of prima facie obviousness**

#### **Rational and Motivation (MPEP §2142-2143)**

It is understood by the Examiner that it is well known in the art to decompose CHP and s-butylbenzene hydroperoxide together in order to speed up the oxidation process and decrease formation of by-products as recited by Pompetzki et al. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the instant invention to modify or optimize the process such as by adding starting materials in order to arrive at a more purified product. In the instant case, one of ordinary skill in the art at the time of instant invention would have recognized the advantage of combining CHP and s-butylbenzene hydroperoxide in the process for making phenol and would have been motivated to carry out the process based on the teachings of Zakoshansky and Pompetzki et al.

Although the temperature and pressure ranges taught by Zakoshansky are not specifically that which is claimed by applicant, merely modifying the process conditions such as temperature and concentration is not a patentable modification absent a showing of criticality. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Also, it would have been obvious for one of ordinary skill in the art at the time of the present invention to use only one reactor in the decomposition of CHP as it is well

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known in the art to do so, as exemplified by Pompetzki et al. One of ordinary skill in the art at the time of the instant invention would have been motivated to do so depending on variables such as cost and availability.

### ***Allowable Subject Matter***

Claims 52 and 55-56, 83-88 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 17-18, 59-64 and 89-140 are allowable.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kellette Gale whose telephone number is (571) 272-8038. The examiner can normally be reached on M-F (6:30am-3:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman Page can be reached on (571) 272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kellette Gale  
Patent Examiner  
Technology Center 1600

July 7, 2006

A handwritten signature in black ink, appearing to read 'S. Barts', is written over a horizontal line.

Samuel Barts, Ph.D.  
Primary Patent Examiner  
Technology Center 1600